

Memo



To: Dave Godfrey, City of Kirkland
From: Berger
Subject: Understanding the Corridor

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Task 2.0 - Understanding the Corridor

The critical first step in developing the vision for the future of the Cross Kirkland Corridor as an integral element of Kirkland's transportation infrastructure now and well into the future. This study is building a firm understanding of the corridor's present as well as its past. In order to establish this understanding, the design team has worked to collect and analyze a wealth of data from historical and cultural documents to engineering and utility drawings. The research efforts and subsequent findings are separated into three main studies:

- A. Functional and Safety Study
- B. Environmental Study
- C. Urban Planning and Cultural Study

The findings are presented in this memo. They are supported by the accompanying analysis graphics, which were formatted from a comprehensive base map that the design team developed to visually study the many forces that will shape the master plan.

This memo is a draft, as we will continue to hone it with input from our consultants and the city as well as add additional information. Even after finalization we will inevitably learn as we move forward.

Task 2.2 – A: Functional and Safety Study

The Functional and Safety Study identifies the critical elements shaping safety and engineering for the Cross Kirkland Corridor. These elements will shape both the development of the corridor from bikes and pedestrians, as well as the ultimate incorporation of high capacity transit into the corridor in the more distant future.

Intersections and Crossings

A key feature of this analysis is the treatment of pedestrian and vehicular intersections along the corridor. These intersections are identified below and discussed in order from south to north. The city has expressed a desire to consider grade separation at most street intersections. Several crossings at street intersections will receive treatments (signing, marking, flashing beacons) with the interim trail project. These improvements will be reused where possible in future development.

- **108th Ave. NE**
 - High volume street with higher vehicular speeds (relative to other neighborhood streets)
 - Downhill curve on approach from the north with limited visibility
 - Should consider signalized crossing

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- Visibility could possibly be increased by selectively clearing vegetation or modifying the existing medians.
- This intersection has the potential to serve as a major gateway for both the Cross Kirkland Corridor and the City of Kirkland.
- There is great potential for transit connections at this location: trail, bus stops, and the South Kirkland Park and Ride facility. In June, the City of Kirkland received a grant to help develop a connection between the corridor and the Park and Ride.
- Given that this intersection represents the southern terminus of the corridor (i.e., there is no formal trail connection to the south across 108th Ave. NE), one option is to steer demand away from this intersection until such time that Bellevue/King County develops the trail to the south. In the interim, the southern end of the trail could be directed to the South Kirkland Park and Ride facility.
- The ultimate connection south to Bellevue (the “Missing Mile”) — specifically connecting to the burgeoning BelRed district and Sound Transit’s East Link rail line—should be considered.
- **NE 52nd Street**
 - Steeply sloped crossing limits views of trail for traffic approaching from west (uphill approach).
 - Slope also does not provide sufficient flat area of road for vehicles to stop at the trail intersection.
 - The trail crosses the roadway at a non-perpendicular angle, which impacts visibility and lengthens crossing distance.
 - NE 52nd Street has relatively low volume and speed humps on both sides of the intersection.
 - Adjacent vegetation limits sight triangles of both road and trail.
 - Should consider signals—flashing light.
 - There is the potential for utilizing adjacent right-of-way (ROW) to improve the angle of intersection.
- **NE 68th Street**
 - Existing grade separated crossing (above roadway), assumed to be structurally viable for active transportation.
 - Steep grades from trail down to road make for challenging connections.
 - Connection down to NE 68th Street has a high volume of foot traffic as evidenced by ‘goat trails’ or pedestrian desire lines.

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- Elevated roadway crossing offers an interesting change of perspective along the trail and provides interesting views westward and eastward.
 - The narrow crossing section represents a potential 'pinch point' for trail traffic. As the circulation space is compressed, bikes and pedestrians comingle.
 - Potentially important link to adjacent school (Lakeview Elementary) and Terrace Park.
- **Google Campus Crossing**
 - Yet to be constructed.
 - Controlled parking access limits Average Daily Traffic (ADT).
 - Should establish clear ROW priority.
 - Provides opportunity for a seamless and unique blend of safe crossing with adjacent uses.
 - Potential to develop pedestrian link south to 6th Street.
- **6th Street**
 - Proximity of crossing to 5th Place S creates challenges
 - Higher volume/skewed crossing.
 - Opportunity for key transit connection point: trail with bus lines and bike lanes along 6th St.
 - 5th Place S ROW may be opportunity for optimal crossing resolution as well as a significant access point for the corridor.
 - Proximity to downtown Kirkland offers opportunity for connections.
 - City of Kirkland has interest in grade separated crossing.
- **Kirkland Way**
 - Existing grade separated crossing (above roadway), assumed to be structurally viable.
 - Non-standard vehicle widths and clearances for roadway below.
 - Currently, no desire lines from trail to street, which has no sidewalks and relatively high speed traffic.
 - Near trail that leads to downtown Kirkland.
 - Vegetation and steep grades present accessibility challenges.
 - Elevated roadway crossing offers an interesting change of perspective along the trail and provides interesting views.
 - The narrow crossing section represents a potential 'pinch point' for trail traffic. As the circulation space is compressed, bikes and pedestrians may have to comingle.

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- Close proximity to Kirkland Ave. that links to pedestrian crossing of I-405 at NE 80th Street.
- **NE 85th Street**
 - Trail crosses underneath roadway.
 - Short crossing length helps mitigate safety concerns.
 - Off-trail east/west connections are just south of overpass and eventually connect to NE 85th St.
- **7th Ave.**
 - Relatively good visibility and minimal crossing width (two travel lanes).
 - Potential conflict with intersection of 112th Ave. NE that is immediately adjacent to trail crossing.
 - Potential to combine intersections.
 - Medium volume, speed. Crossing on grade heading down to the west.
- **110th Ave. NE**
 - Relatively good visibility and minimal crossing width (two travel lanes).
 - Relatively low vehicular speed and low traffic volume.
 - Potentially important link to adjacent school (Peter Kirk Elementary).
- **NE 112th Street**
 - Good visibility and perpendicular angle of intersection.
 - Relatively high vehicular speeds.
 - Opportunity for median.
- **NE 116th Street**
 - Trail crosses underneath roadway.
 - Short crossing length, high bridge height helps mitigate safety concerns.
- **120th Ave. NE**
 - May be one of the more challenging crossings due to limited visibility, topographic 'dip' and its location between two controlled intersections.
 - Candidate for a grade separated crossing.
 - High volume, higher speed roadway on skew.
- **I-405**
 - Long undercrossing due to road width of I-405 above.
 - Length of undercrossing and low light levels has negative implications for the perception of safety.

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- If a grade separated crossing were to be implemented at 120th Ave. NE, that could transition onto a fill prism or elevated trail condition that would extend through the I-405 underpass and promote thru-circulation of the space (not conducive to lingering).
- **NE 124th Street/Totem Lake Blvd.**
 - High volume streets with high vehicular speeds.
 - Signalized surface crossing could be accommodated (with some land acquisition possible). Long signal wait times will invite misuse as a trail crossing, particularly by cyclists transitioning to road riding in order to avoid wait times.
 - Candidate for grade separated crossing. Elevated crossing must be developed with consideration of required clearances from Seattle City Light (SCL) power lines above. Note planned PSE 115kv line.
- **128th Ln NE and 132nd NE**

Major Non-Vehicular Crossings

There are several notable pedestrian-only trail crossings, as well as one-sided “feeder” pedestrian access points, and these too need to be considered from a safety standpoint.

- **NE 60th Street**
 - Major east-west crossing connecting to Lake Washington and waterfront parks.
 - Represents a ‘pinch point’ on the trail (verify legal boundaries).
 - Historic connection from Lake Washington to east.
 - Leads to I-405 pedestrian bridge.
- **Kirkland Ave. (to Railroad Ave.)**
 - A strong pedestrian connection.
 - Historically important link from ferry landing to railroad depot.
 - I-405 pedestrian crossing.
- **18th Ave. to NE 100th Street**
 - A significant east/west link crossing the corridor connecting Market Street eastward (indirectly in places) to Willows Road, the Redmond Central Connector (Phase 2), and the PSE power line trail.
 - Leads to I-405 pedestrian bridge.

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Additional Safety Issues

Corridor bridge analysis: Existing bridges, while varying in age and structure, were designed to take significant loads associated with freight railroad, which they served until recently. Using these bridges as part of a trail corridor will require some retrofitting to provide required surfacing, possible widening to desired widths, and the opportunity for each become a unique icon and experience along the CKC. By reusing the bridges for a shared-use trail corridor (with its greatest loads likely associated with comparatively slim loads of emergency vehicles [ambulances] and lightweight maintenance vehicles) structural loads applied to the bridge will be greatly reduced from their railroad-designed loads. For the purposes of this master plan all bridges are assumed to be in adequate condition to be repurposed as part of the shared-use trail, though ongoing maintenance and cosmetic work will inevitably be required in addition to applying new decking/surfacing. During the design phase of corridor improvements a more detailed analysis of the structures should be performed.

Beyond the bridges' function as providing a crossing for the CKC trail, they also allow vehicular connections beneath the trail. In some instances the road undercrossing are undersized and do not meet current clearance guidelines, but this master plan does not assess or propose remedies to address shortcomings of vehicular undercrossing beneath the bridges other than the following notations.

Safety and perception of safety:

The majority of the corridor feels safe and provides adequate ingress and egress locations to be safe, with a few notable sections.

- The stretch of trail from 108th Ave. NE to NE 52nd Street is the longest stretch without formal ingress or egress points due to topography and adjacent residents that "back" onto the corridor.
- Both the NE 85th Street undercrossing and the NE 116th undercrossing are high enough and narrow enough over the trail that it does not raise safety concerns; however, the abutments of the bridge, particularly to the west, are a target for graffiti and could be attractive spots for loitering and camping.
- The I-405 undercrossing is very long with walls between columns obscuring views throughout the undercrossing and creating a perception of an unsafe place.

Additional Functionality Issues

Utilities: There are several existing and planned utilities that share the CKC corridor and will affect how the corridor can be developed. These include:

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- **Metro trunk sewer line:** A large metro sewer line follows a significant portion of the corridor at varying depths. In places it's more than adequately deep so as not to limit the corridor's design except to maintaining required access. However, there are places where its shallow depths (in some instances higher than the railroad track way under an earthen berm) will limit how the trail can be used. In all instances any improvements built over the corridor must be mindful of the sewer line. The line is on an easement owned by King County.
- **Fiber optic:** A parallel line along a majority of the corridor at varying depths which could limit grading. (Note: Research to be completed identifying easement agreement and limitations and responsibilities associated with moving the line.)
- **SCL transmission line:** An existing transmission line paralleling 124th Ave. NE and crossing over Totem Lake and the CKC's intersection with 124th Street and Totem Lake Boulevard, possibly affecting the trail's crossing of this intersection due to required aerial clearances.
- **PSE transmission line:** A new aerial PSE transmission line is planned along the northern portion of the CKC connecting the Juanita transmission station with Willows Road. Design is underway and may be shaped by the CKC master plan process.
- **Other utilities:** Other utilities cross or are adjacent to the corridor including water supply lines (near Watershed Park) and power lines (multiple locations). PSE owns an easement along the length of the corridor for its facilities.
- **Need to talk about the ST easement.** Don't know the place for that discussion.

Task 2.2 – B: Environmental Study

The following environmental study focuses on the major environmental elements, both physical and regulatory, shaping the corridor's development. The analysis goes further in seeking out opportunities to augment or connect these elements for the benefit of the corridor.

Corridor Hydrology

The corridor contains a rich and extensive hydrologic network of streams, ditches and wetlands. There are approximately 27 instances where streams meet or cross the corridor. In addition to the streams, a significant portion of the corridor is paralleled by a system of ditches that collect and convey stormwater runoff. Several wetlands are also found within the corridor and its adjacent areas.

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Understanding the corridor's stormwater functions will be a critical step in the master plan development. Streams and wetlands should be protected and enhanced while the ditches should be evaluated for stormwater capture and treatment opportunities.

Due to the unique engineering requirements of railroad engineering, notably that it be relatively level with subtle transitions in grade, the CKC crosses (and in some cases alters) many drainages, creeks and watersheds that once naturally flowed to Lake Washington through different paths. This unique quality may allow drainage and stormwater opportunities to develop that both enhance and restore existing and severely altered watersheds.

The City of Kirkland is currently preparing a Surface Water Master Plan that will further explore the role of the corridor in managing Surface Water.

Corridor Topography

The length of the corridor contains a diverse range of topographic conditions. Of particular concern to the master plan are steep slope areas. Much of the corridor is either perched upon a fill prism of earth or sharply cut into a hillside or canyon. The resultant steep slopes have implications on trail access, safety, view sheds, stormwater runoff and erosion. They have been identified in the working base map and should be considered in master plan development.

The existing topography suggests the opportunity to develop a trail along the existing railroad track way as well as the addition of a second parallel trail along much of the corridor with relatively little grading to the existing topography. However, there is potential to trigger environmental regulation and permitting associated with steep slopes and wetlands.

Beyond the design of the trail corridor, topography will significantly influence how the corridor grows and evolves over time when additional corridors (including transit) are integrated. Widening the corridor to accommodate multiple transportation paths may include both cutting and filling of existing conditions and may also include structural solutions to increase usable ROW width or mitigate or improve environmental conditions, particularly where existing fill prisms span over existing ravines.

Viewsheds

The topographic conditions along the corridor frequently make for stunning viewsheds or areas with significant views beyond the corridor's boundaries.

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In several locations views out to Lake Washington, Seattle and the Olympic mountains are possible. These viewpoints will prove to be significant spots along the corridor and will lend a great deal of identity to the trail experience. Particular care should be given to these locations while considering grading and planting strategies to complement the views.

Along the corridor there are also opportunities for stunning territorial views of the surrounding landscape. These include eastward views from any of the existing railroad trestles, the surprisingly rural Forbes Creek ecological corridor to Juanita Bay, and the greenbelt backdrop to Totem Lake, amongst others.

Green Bands

As the corridor is intended to be a regional trail with broad pedestrian and neighborhood connections, so too should it be considered for its regional ecological connections. At close to six miles in length, the corridor encompasses a wide range of vegetation communities. It also intersects—and contributes toward—significant contiguous tree canopy and vegetation coverage. It is important to note that this significant vegetation is on public properties owned by multiple entities and agencies and a large number of private owners. Yet the ecological function is blind to legal boundaries, and whatever the ownership, the enhanced connections between these properties can enhance ecological function with thoughtful design interventions and management over time. The contiguous tree canopy and vegetation are critical elements of regional ecology. They provide wildlife habitat and places for wildlife movement as well as a host of other ecological services that include a reduction in the urban heat island effect, maintaining biodiversity, and stormwater mitigation.

Beyond the ground plane it is important to recognize the value and critical ecological function of connecting tree canopies together, even as more intensive land use and human activities occur at the ground level.

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Task 2.2 – C: Urban Planning & Cultural Study

The Urban Planning and Cultural Study looks at Kirkland as a unified whole as well as its constituent neighborhoods and zones (both existing and future).

Neighborhoods

Kirkland is decidedly a city of neighborhoods, neighborhoods rich in history with their own unique identities. Each neighborhood contributes to the greater whole and should be given particular focus in the master plan development.

City/Region

While the corridor directly borders or passes through eight neighborhoods, it is also viewed as a regional connector that serves the city and reaches out to the broader region beyond.

Character Zones

The corridor has its own neighborhoods or, rather, areas of distinct character or physical conditions that should be considered. They are listed below in order from south to north. (These are working titles, intended to give a sense of character and place, but subject to evolution as the master plan process continues.)

- **Yarrow Woods:** Stretches from 108th Ave. NE to around Carillon Point. This zone is characterized by dramatic topography (steep slopes down to and away from the corridor) and a forested edge with occasional breaks for views to the west. This stretch has the fewest access points (108th Street and NE 52nd Street) due to topography and the many houses that “back” onto the corridor with no public access points, though Watershed Park has a network of informal trails that can more deliberately form connections from CKC to the surrounding neighborhood.
- **Houghton Porch:** Heading north from Yarrow Woods, this zone extends NE 65th and is primarily characterized by open views to Lake Washington to the west. The westward focus of this zone is structured by the topography which rises up from the corridor moving east but falls from it heading west. There are several opportunities to improve or shape new connections from the existing street grid to the corridor. The one time presence of the Lake Washington shipyards has historically shaped this portion of the trail and could be a source of inspiration as this section is developed.
- **Buzz Zone:** Extends north to the corridor intersection with 6th Street S. It is titled ‘Buzz Zone’ due to the existing commercial and business character and near-term development potential, including further development of the Google campus. While Google is a wonderful part of the Buzz Zone and provides opportunities for a

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creative workforce, it is only part of what builds the zone's character, as this section is envisioned as a broader collection of elements, commerce, services and businesses to bring diversity and vitality.

- **Everest Edge:** Bounded by 6th Street S and NE 85th Street to the north, this zone is characterized by relatively level terrain that transitions to the high volume streets of Kirkland Ave., Railroad Ave. and Kirkland Way. This stretch has a greenbelt-like quality with Everest Creek crossing the corridor and the ability to forge a strong connection with Everest Park. This stretch has the dual historic references of Kirkland Way, connecting from the Kirkland ferry dock eastward to Redmond and the former train depot, to which ferry riders would connect.
- **Norkirk Edge:** Reaches north to the corridor crossing of 110th Ave. NE. This trail section is primarily identified by the properties along the west (Norkirk) side, with the potential of a vital commercial or mixed-use district activating the trail's edge.
- **Highland Pass:** Continues north to approximately 116th Ave. NE. This zone is characterized by dense vegetation and an extensive forest canopy above. The trail's strong sense of enclosure is reinforced by the canyon-like topography. The "pass" has a unique high point from which the abundant water in ditches adjacent to the corridor separates into north and south flows at a "Kirkland Divide" that is a subtle yet interesting element on the corridor. As the corridor moves northward it transitions from a canyon to a narrow shelf perched high above Forbes Creek valley with a connection to the Juanita Bay Park and powerful territorial views. While it would be easy to describe this stretch as natural it is important to note it is home to many invasive and non-native species.
- **Play Zone:** The Play Zone is a rebranding of the PARMAC area and extends north to 120th Ave. NE. The name honors the recreation related activities now occupying the transitional industrial area. It also sets the tone for the evolving area and provides an opportunity for the corridor to foster play.
- **Interstitial Zone:** This is an area where the Play Zone has ended but the next zone, Totem Lake, has yet to formally begin. It marks the potential overcrossing of 120th Ave. NE and undercrossing of I-405. Unlike other areas on the corridor, this is a zone where the trail is a crossing element. It is dedicated to moving through a space rather than a catalyst to development on either side of the corridor. Additionally, this stretch of trail is unique in that it does not come with a sense of community ownership in its existing state.

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- **Totem Lake:** The Totem Lake zone begins at the undercrossing on the east side of I-405 and continues east to the city limits. Totem Lake Park is pulled into the realm of the corridor to form a significant swath of green space within the Totem Lake neighborhood. Totem Lake, as delineated by the city, spans east and west of I-405, yet the two sides feel very disconnected, with most east/west connections as bridges and underpasses that serve as I-405 access points or major transit facilities.

Opportunity Zones

In evaluating planning, density and development opportunities along the Cross Kirkland Corridor, there are several zones with greater near-term potential for growth and development that can both influence and be influenced by the corridor's development. In some instances these opportunity zones are part of a character zone and in some instances they are the character zone. The five such are listed and evaluated below.

- **South Kirkland Park and Ride (Yarrow Woods)**

As the southern terminus of the CKC and at the southern end of the Yarrow Woods character zone, this area is an exceptional opportunity for change and growth, already exemplified with the new South Kirkland Park and Ride improvements.

- Great potential as a Transit Oriented Development (TOD) with connections to diverse transit options.
- Connections to the new SR 520 and its shared use path connecting to Seattle and the UW.
- Existing commercial and office land use patterns, yet significant opportunity for increased density, with extensive surface parking allowing potential development space.
- A disconnected street network could be regularized and create enhanced "in neighborhood" car, bike and pedestrian connections.

- **Google Campus/Light Industrial Zone (Buzz Zone)**

With the existing (and expanding) Google campus, significant office/professional services presence along 6th and a strong commercial/services district, the buzz zone is a unique change in character along the corridor. It presents the opportunity to be a catalyst for trail while the trail is also a catalyst for desired growth.

- With the development of the Google campus, this zone has already begun a significant transformation into a vibrant, exciting place.
- Retail and services provide vitality to the neighborhood, but primarily accessed by car.
- There is opportunity, but no direct connection, between CKC and the business district.

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- There is the opportunity for significantly more office and commercial development while still protecting and buffering surrounding residential development.

- **The Norkirk Commercial Area (Norkirk Edge)**

The existing commercial and civic development along the corridor suggests the opportunity that redevelopment may occur, particularly along the CKC edge, benefiting from trail traffic and infusing the corridor with an active edge.

- The Norkirk edge allows territorial views to downtown Kirkland and fairly direct connections, making it a gateway to downtown for those traveling from the north.
- The existing public works facility provides additional public realm (and an oddly cool utilitarian edge) to the trail corridor.
- The cannery building is a community jewel that could have increased community use and opportunity.

- **The PARMAC Area (Play Zone)**

This existing light industrial area has a unique character, largely shaped by its limited accessibility and the changing uses occupying warehouses once severed by the railroad. This emerging land use, with many recreational amenities or services, provides the opportunity to charge the corridor with a unique character, as well as brand this area with a unique “attitude” now and into the future, even as it evolves.

- With very poor and hard to find vehicular access from the rest of the city, the CKC will greatly improve access to the area.
- The near-term CKC users on bike and on foot will tend to be the very “recreation minded” population that already uses the area, increasing the likelihood of the CKC as a true transportation connection.
- Existing tenants and uses along the corridor can open up to the corridor and spill their life and activity onto the corridor.

- **Totem Lake**

The CKC master plan considers the east side of I-405 as the opportunity to create a cohesive emerging urban district built around the true Totem Lake. The development of a new vision for Totem Lake, one built around the lake itself, and one in which the CKC becomes a green transportation spine that connects to the rest of the city and region beyond, could be the catalyst to move the long stalled reimagining of Totem Lake forward. (While planning and land use show Totem Lake spanning I-405 to the west, and this western zone is a great opportunity to evolve and grow, the divide of I-405 makes it challenging to perceive both sides as a single neighborhood.)

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- The confluence of the corridor with two major roads (124th and Totem Lake Boulevard) will allow what is today a crowded intersection to be seen as an icon and counterpoint of a revitalized community.
 - The proximity of major employers and the large scale opportunities for more development (and more major employers) make Totem Lake a critical link along the CKC.
 - The public investment in the CKC and Totem Lake Park can become a catalyst for the desired types of growth.